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University of Toronto

December 74

ISSN 0315-4661

No.119

ASSOCIATE DIRECTOR -- OUTWARD BOUND

Dr. Dave McNaughton, Associate Director of UTCC, will be leaving at the end of December to become the new Director of the Computing Centre at Queen's University in Kingston.

Dr. McNaughton came from the University of Waterloo Computing Centre four years ago to be Operations Manager at UTCC. During these four years, his ability and dedication have led him to the position of Manager of S/370 Services and to his appointment as Associate Director.

I know the entire staff and the user community join me in congratulating Dr. McNaughton on his appointment and in wishing him every success in his new position.

John Wilson

NEW EDITORIAL ASSISTANT

This month we welcome Ruth Borenstein as a new member of the UTCC Publications group. Ruth graduated from the University of Toronto with a Bachelor of Arts degree and since August, 1974 has been working at UTCC as secretary to the Associate Director, Dr. McNaughton.

Ruth will be working as an editorial assistant and occasionally helping out with the ATS typing. Ruth can be contacted in the Sandford Fleming Building, room 125, phone 928-6672.

Janet Campbell

UTCC RATE SCHEDULE CHANGES

As most of you are aware, the University of Toronto Computer Centre has been faced with increased operating costs over the last few years. Effective January 1, 1975, the UTCC Rate Schedule will be adjusted to more closely reflect UTCC operating expenses.

The Computer Centre Policy Committee has approved the rate changes and a letter detailing the new rates has been sent to UTCC account holders. An official USERBOOK update containing the new rate schedule will be distributed to subscribers in the next few weeks. Additional copies of the rate schedule may be obtained from the Terminal Co-ordinators, the Information Office, SF128 or from the UTCC Services Manager.

In order that University of Toronto administrative, educational and subsidized research computer users may maintain their computer purchasing power, educational and administrative computer users will be allocated additional funds, while research users will have the research subsidy increased. The effects of the additional funds and the increased subsidy are intended to offset, as much as possible, the effects of the rate increase.

John Wilson

UTCC REORGANIZATION

Historically, the organization of the University of Toronto Computer Centre has been based on 'product lines' or 'service areas'. On December 2, 1974, UTCC was reorganized into three areas: Services, Operations, and Administration.

UTCC has been planning for and working towards this 'single system' organization for some time. The new organization consolidates all of the hardware operations and systems software responsibility into one unit; the batch terminals, applications software and user information services into another unit and the Centre's Administrative services into a third unit. Details on the functional organization within each area will be included in articles appearing in future issues of COMPUTERNEWS.

This reorganization should result in the more efficient integration and co-ordination of the Centre's manpower and resources and is part of our continuing efforts to provide reliable, efficient services to our user community. Users will continue to interface with the same staff members but many of the office locations have been changed. Please see the article 'NEW OFFICE LOCATIONS' appearing below.

John Wilson

NEW OFFICE LOCATIONS

The following chart summarizes some of the new office locations for UTCC personnel. Note that most of the phone numbers remain unchanged. The office changes will take place Friday, January 10, 1975.

<u>Name</u>	<u>Old Office</u>	<u>New Office</u>	<u>Phone</u>
Bill Gillart	SF125	SG301	6355
Herb Kugel	SF125	SG301	7286
Ford Clancy	SG304	SG301	6021
Ian Darwin	SF116	SG301	7318
Len Prepas	SF116	SG303	8701
Kin Fong	SF116	SG304	4924
Bob Radcliffe	SF116	SF214A	to be announced
John Roth	SF116	SG304	5469
Joyce Walton	NP1207	SG204	to be announced
Ruth Greer	SF114	SG204	6175
Stan Yagi	SF115	SG200	7331
Mark Tapia	SF114	SF125	7109
John Wilson	SG303	SF143	6496
Al Heyworth	SG205	SF116	4936
Ruth Borenstein	SF143	SF125	6672
Dave Scobie	--	SG303	to be announced

Key

SF - Sandford Fleming Building

SG - 49 St. George Street

NP - New Physics - Burton Tower

Stan Yagi

RECENT ACQUISITIONS IN THE
DEPARTMENT OF COMPUTER SCIENCE
LIBRARY

Abramson, Norman Mand Kuo, F.F.,
editors

Computer-communication Networks.
Englewood Cliffs, N.J., Prentice-
Hall, 1973.

cont'd...

RECENT ACQUISITIONS

Cont'd.

Ann Arbor Conference on Graph Theory,
3rd, University of Michigan, 1971.

New Directions in the Theory of
Graphs; proceedings. edited by
Frank Harary.

New York, Academic Press, 1973.

Armstrong, Russell M.

Modular Programming in COBOL.

New York, Wiley, 1973.

Bennett, A. Wayne

Introduction to Computer
Simulation.

St. Paul, Minn., West Pub. Co., 1974.

Computer and Information Sciences
Symposium, 4th, Miami Beach, 1972.

Information Systems, edited by
Julius T. Tou.

New York, Plenum Press, 1974.

Deo, Narsingh

Graph Theory with Applications
to Engineering and Computer
Science.

Englewood Cliffs, N.J., Prentice-
Hall, 1974.

Emden, M.H. Van.

An Analysis of Complexity.

Amsterdam, Mathematisch Centrum,
1971.

Goldstine, Herman Heine

The Computer from Pascal to von
Neumann.

Princeton, N.J., University Press,
1972.

Jackson, Philip C., Jr.

Introduction to Artificial
Intelligence.

New York, Petrocelli Books, 1974.

Philippakis, Andreas S. and Kazmier,
L.J.

Information Systems through
COBOL.

New York, McGraw-Hill, 1974.

Yugoslav International Symposium on
Information Processing, 5th,
Bled, Oct. 1969.
Proceedings.

PERSONNEL CHANGES

Leaving the Centre this month
is Kiran Patel. Kiran is a
computer operator with Operations.
Good luck with your new endeavours.

Trudy Holland

COURSES

The next set of short non-
credit courses to be offered by the
Computer Centre will begin in mid
January. The set of courses
announced in this issue of
COMPUTERNEWS is not the complete
list. More courses will be
announced in next month's issue.

INTRODUCTION TO COMPUTERS

Prerequisite: None

Dates: January 20,21,23

Time: 6 -7:30 p.m.

Maximum # of Registrants: 30

Instructor: K. Fysh

This course is for people who
have had little, if any, contact
with computer programming. It is
recommended as a prerequisite for
any non-programmer intending to
take an introductory course in any
language during this schedule or at
a later date. The course will
explain the basics of:

cont'd...

COURSES

Cont'd.

Bits, bytes, hexadecimal arithmetic, storage concepts, machine language, the role of processors/compilers, and program design techniques.

The student will have the opportunity to demonstrate and apply the concepts he learns by preparing and executing a simple program to meet specifications set by the instructor and through a short quiz.

DATA MANAGEMENT AND PROGRAMMING
TECHNIQUES IN APL*PLUS

Prerequisite: Programming with
APL*PLUS (faculty,
staff or graduate
students)
Dates: February 3,5,7
Time: 4 - 6 p.m.
Maximum # of Registrants: 15
Instructor: F. Clancy

This intermediate level course is designed to aid users already familiar with APL in writing applications utilizing the enhancements embodied in APL*PLUS.

The course will consist of two problem cases and their solutions and will include a general discussion of the aspects of data accumulation, security and addressing techniques using the file subsystem. An APL account will be available for the duration of the course. Registrants will be encouraged to write APL functions and to discuss their results.

Enrollment is limited. This course is intended for faculty, staff and graduate students.

INTRODUCTORY LANGUAGES

The introductory languages offered are intended to act as starters. After completing the course, the student should have a good idea of whether or not he wants to learn the language. Each course will instruct the student in the basic statements and operations of the language. Assignments will be given out and the lecturer will base his presentations on these assignments. Computing facilities will be made available through the course. The student will be able to evaluate his progress by preparing and running a final assignment.

INTRODUCTION TO SPITBOL

Prerequisite: Knowledge of another language; SPITBOL is not recommended as a first language.

Dates: January 27,29,31
February 3,5
Times: 3 - 4 p.m.
Maximum # of Registrants: 30
Instructor: S. Pozgaj

SPITBOL is a language designed to facilitate character and text manipulation (e.g. text editing).

AN INTRODUCTION TO APL

Prerequisite: None
Dates: January 27,29,31
Time: 4 - 6 p.m.
Maximum # of Registrants: 30
Instructor: D. Lacy

An introduction for the novice user to interactive computing using APL (A Programming Language), a concise and powerful computational tool.

cont'd...

COURSES

Cont'd.

Topics such as the workspace concept, primitive functions, primitive operators, system commands and function definition will be discussed. APL accounts will be available for the duration of the course. Registrants will be encouraged to write APL functions and to discuss their results.

INTRODUCTION TO WATFIV

Prerequisite: Introduction to computers;
experience in another
programming language.

Dates: January 27,28,30

Time: 6 - 7:30 p.m.

Maximum # of Registrants: 30

Instructor: K. Fysh

SPEAKEASY

Prerequisite: None

Date: February 10,12,14

Time: 4 - 5 p.m.

Maximum # of Registrants: 30

Instructor: J. Roth

SPEAKEASY is a computer language for interactive processing of data in the physical and social sciences. The language is designed so that the user can obtain immediate results to both simple and complex problems. The structure of SPEAKEASY is such that the user can quickly and easily master the language. The course includes an introduction to the language and a description of its elements and special features. No previous programming experience is needed. Access to the system will be provided through the course.

Don Gibson

Registration for Computer Centre
Non-credit Short Courses

NAME

(FIRST)

(LAST)

Mailing address **including city or borough**. If you have a university address please use it. (Please be sure that you are known at the address you give -- we have received numerous undeliverable rejects in the past).

DEPARTMENT

OR MAJOR COURSE

PHONE

Please enroll me in: (circle number)

C1. Introduction to Computers

C2. SPITBOL

C3. WATFIV

C4. SPEAKEASY

C5. Introduction to APL **

C6. Data Management and
Programming Techniques

If you are taking C5, you will not be permitted to enroll in C6 at this time. You will need more experience in APL before you take C6.

Confirmation of course(s) will be sent to the above address along with the room number in which the course will meet.

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Short Courses
Computer Centre
Room 128
Sir Sandford Fleming Laboratories
10 King's College Road
University of Toronto
TORONTO, Ontario
M5S 1A1

NEW CHARGING ALGORITHM

The Computer Centre Policy Committee recently approved the charging algorithm to be used with the VS2 Release 2 operating system on the System/370-165-II. A letter explaining the new algorithm was sent to S/370 account holders during the first week in December, 1974.

The new charging algorithm is based on a CPU usage charge and a tape/disk I/O usage charge based on the number of EXCP's (Execute Channel Program) issued by the program. The rate schedule charges announced in a previous article will, of course, result in increased job charges. Users who suspect that large differences in job charges are a result of the new charging algorithm should contact the Terminal Co-ordinator or UTCC Services Manager.

The new algorithm and new rate schedule constants for the S/370-165-II appear below.

Stan Yagi

SYSTEM/370 SERVICE - The Time Sharing Job Stream

JOB CHARGE	=	$(\$CPU * CPUTIME) + (\$EXCP * EXCPCOUNT) + CTC$
where:		
\$CPU	=	\$16.00 per CPU minute
\$EXCP	=	\$2.85 per thousand EXCP's
CTC	=	Connect Time Charge \$3.50 per connect hour

N.B. CPUTIME and EXCPCOUNT as above.

SYSTEM/370 SERVICE - The General Purpose Job Stream

JOB CHARGE	=	$SF * ((\$CPU * CPUTIME) + (\$EXCP * EXCPCOUNT) + UR + PDC)$
where:		
SF	=	Service Factor of 2.00 for Priority 8 1.00 for Priority 6 0.75 for Priority 4
\$CPU	=	\$14.00 per CPU minute
CPUTIME	=	measured CPU time in minutes
\$EXCP	=	\$2.50 per thousand EXCP's
EXCPCOUNT	=	measured count of EXCP's
UR	=	Unit Record Service Charge \$1.00 per thousand cards read, plus \$1.00 per thousand lines printed, plus \$2.50 per thousand cards punched
PDC	=	Peripheral Device Charge \$1.00 per tape mount, plus \$2.00 per printer mount, plus \$3.00 per disk mount

VS2 RELEASE 2 IMPLEMENTATION

The Saturday and Sunday evening test times in which users participated in testing VS2 have been quite successful. Between sixty and one hundred users of our General Purpose and High Speed services turned out for each of these occasions.

UTCC staff were present to field any problems that were encountered under VS2. The majority of problems reported were errors that would normally have occurred under MVT. However, several new problems directly attributable to the VS2 operating system environment were reported. Many of these problems have now been fixed or are in the process of being fixed. A VS2 Problem Report form is available at all terminals and should be used to document any suspected VS2 problems.

Users were able to run their jobs without making any changes to their job control cards or programs. VS2 reference manuals which were available in the Information and Advising offices remained unused for the most part. A VS2 update to USERBOOK outlining changes and new functions for General Purpose Job Stream and TSO services is being mailed to USERBOOK subscribers and is also available at the Information Office and Batch terminals. High Speed Job Stream services remain basically unchanged.

The large number and diversity of jobs run revealed previously undetected problems in the VS2 operating system. The major known VS2 system problems will have been solved before the implementation of a VS2 production system. The production VS2 system will be more reliable as a result of the extensive user testing.

We have begun tuning the VS2 system using the performance information gathered during the test evenings. The system load during these test periods was dominated by a large number of compute bound jobs and was not typical of the J65-II production load. Tuning is an iterative process and it will take time before we are completely satisfied with VS2 performance.

Problems uncovered by the VS2 user tests and some setbacks in systems software conversion efforts resulted in a delay in VS2 implementation. We will have a more reliable and better timed system as a result of users who took interest and participated in the VS tests.

Rein Mikkor

USER FORUM ON VS2 RELEASE 2

A VS2 Release 2 User Forum chaired by Stan Yagi, Services Manager, was held on Tuesday, December 10, 1974. Topics discussed included the testing and implementation of VS2 at UTCC, the new job accounting algorithm associated with VS2 and the effects of VS2 on jobs already executing successfully under OS/MVT.

cont'd...

USER FORUM

Cont'd.

EISPACK EDITION 4VS2 Testing and Implementation

Rein Mikkor, Software Manager discussed three major problems encountered during the Saturday and Sunday evening VS2 user test periods. The I/O devices have been hanging intermittently and this problem is being investigated by IBM. Initially, the system was unable to properly handle commands entered from the batch terminals' display screens. This problem has been corrected by the Software Development group. Finally, console support for Interactive Terminal Systems has not been implemented and will not be available until after VS2 becomes the production system on the S/370-165-II.

New Job Accounting Algorithm

Al Heyworth, Associate Director explained the new charging algorithm to be used with the VS2 Release 2 operating system on the S/370-165-II.

For details on the new charging algorithm, refer to the article entitled NEW CHARGING ALGORITHM appearing elsewhere in this issue of COMPUTERNEWS.

Impact of VS2

During the Saturday and Sunday user VS2 test periods, most users were able to successfully run their jobs without making any changes to their job control cards or programs. The conversion from OS/VT to VS2 Release 2 should be essentially transparent for most users.

Gilles Chalifour

As an official test site for the Argonne NATS project, UTCC now has available for general testing Edition 4 of the EISPACK package for finding the eigenvalues and eigenvectors of matrices and matrix systems. The new edition includes major upgrades to the package, with 19 new subroutines having been added to the original 39. The new additions provide accurate and efficient treatment of complex general systems and also provide three new facilities. One subroutine performs the singular value decomposition of a matrix, another provides the information for a linear least squares fit, and the third can be used to solve linear systems with symmetric band coefficient matrices. For current users of the package, the calling sequences for Edition 4 are the same as for Edition 3 with the main changes having been made in efficiency.

The new load modules are currently in 'USER.EISPACK4' and can be accessed from the standard FORTRAN procedures using IX=USER and LIBRARY=EISPACK4. The control program, EISPAC, has not been received as yet. Therefore, users who wish to use this control program, should also use the Edition 3 routines in the library called 'APPL.ARGONLIB'.

For further information, see the Argonne National Laboratory Technical Memorandum No. 250 (July, 1974) and #6 in the series 'Lecture Notes in Computer Science' entitled Matrix Eigensystem Routines -- EISPACK Guide. Both documents can be obtained from the Information Office, SF128.

cont'd...

EISPACK EDITION 4

Cont'd.

Users who encounter problems with the routines should contact Mr. Imre Farkas, Department of Computer Science, 928-8747. Problems encountered while using the package should be directed to John Roth, SF116, 928-8701.

After the new control program is obtained and the package is certified, Edition 3 will be replaced. Because the EISPACK routines represent the current state of the art in eigenanalysis, and are more efficient and accurate than other packages, thought has been given to dropping support for various other eigenvalue routines like those in Scientific Subroutine Package (SSP). Anyone objecting to this idea should contact John Roth.

John RothSORTING VARIABLE LENGTH RECORDS

Recently, several users have had problems with sorting variable length records. When dealing with variable length records, the IBM manuals fail to stress the fact that the first four bytes of a variable record contain count information and not data. Therefore, some users have erroneously sorted on this 'count'. In these cases, the results have been confusing and the user has had difficulty in diagnosing the problem since no error messages are produced by the sort.

An example may help to clear things up. Suppose a user is writing data in a FORTRAN program:

```

      .
      .
      .
20    WRITE (1,20) K
      FORMAT (I9)
      .
      .

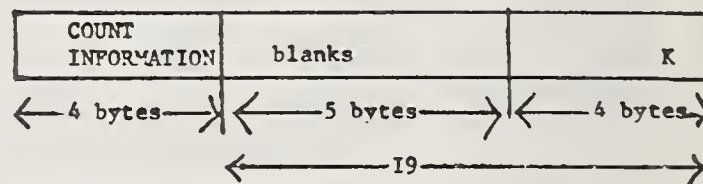
```

```

//GO.FT01F001 DD DISP=(NEW,PASS),UNIT=SYSDA,
//              DCB=(RECFM=VB,LRECL=256,BLKSIZE=256),
//              SPACE=(TRK,(5,5))

```

If K is an integer value of 4 bytes, each data record looks like this:



To sort this data the user should use the following SORT/MERGE control statements:

```

SORT FIELDS=(10,4,BI,D)
RECORD TYPE=V,LENGTH=(252)

```

Here, a descending sort will be used. Note that the sort begins on the tenth character of the data. The 4 byte count and the 5 bytes of "filler blanks" put in by the FORTRAN (I9) statement are skipped. The point to remember is that the sort program treats this 4 byte count as part of the data record and the user must remember to skip past it on his own.

Herb Kugel

ASUT ADVISOR

Effective January 6, 1975, the HSJS advisor at ASUT will be located in SS2104. This move should help to encourage users to solve their own small syntactical errors, leaving the advisor free to assist with more difficult problems.

Marlene Domoney

NEW VERSION OF WATBOL

Version 1.1 of WATBOL will be available on the High Speed Job Stream when VS is installed on the S/370-165-II. WATBOL has been running under the High Speed Job Stream during the user VS test times and no major problems have been reported.

However, some programs which ran successfully under the old version of WATBOL may fail under Version 1.1 due to the new extended list of reserved words. Many new reserved words are now recognized by WATBOL and messages are given if reserved words are used where they are not allowed. This list now incorporates the IBM ANS Version 4 list, the proposed ANS standard list and the CODASYL list of reserved words.

A new list of outstanding problems is available as well as a list of problems fixed by the new implementation. Copies of this document are available at the Information Office, SF128. This information will also be incorporated in the USERBOOK module 3.6HSWATBOL.

Mark Tapia

S/370 RELIABILITY

The reliability statistics for November indicate an uptime percentage of 98.9 while the average number of IPL's per day reached 0.93. The scheduled hours of production for November totalled 465.

Monthly Comparative Figures

Month	%Uptime	Unsched. IPL's/day
Sep	86.8	3.63
Oct	95.6	1.83
Nov	98.1	0.93
Dec	98.6	0.62
Jan	97.0	1.37
Feb	98.3	1.25
Mar	98.7	1.06
Apr	99.3	0.52
May	99.2	0.87
Jun	96.1	0.75
Jul	91.7	1.66
Aug	98.3	0.86
Sep	94.5	1.83
Oct	98.6	1.07
Nov	98.9	0.93

The percentage breakdown of total system downtime for November was: Hardware - 146 minutes (50.9%); Software - 80 minutes (27.9%); Other - 61 minutes (21.2%). The major events contributing to these downtime totals were as follows:

Nov. 2,9,14 - A total of 29 minutes and 4 IPL's were attributed to power problems with the 3704 control unit. IBM was able to rectify problems by replacing all the power elements in the control unit.

cont'd...

S/370 RELIABILITY

Cont'd.

Nov. 13, 14 - A total of 32 minutes and 4 IPL's were attributed to hardware problems on numerous 3330 ITEL disk drives. Data and equipment checks plus tripped circuit breakers were responsible for all errors. ITEL corrective maintenance was required to replace faulty cards in the disk units.

Nov. 11 - A total of 25 minutes and 1 IPL were attributed to a hardware problem with one of the local printers. A jammed train had to be replaced by IBM to rectify the problem.

Dave Rauch

DOWNTIME REPORT QU... 11/13/79... EQU... 11

DAY	REIPL	DNTIME	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
F 1	0	0																					
S 2	3	26																					
S 3	1	5																					
M 4	0	5																					
T 5	0	10																					
W 6	0	0																					
T 7	0	0																					
F 8	0	0																					
S 9	4	23																					
S 10	1	5																					
M 11	3	38																					
T 12	1	12																					
W 13	3	22																					
T 14	4	29																					
F 15	1	15																					
S 16	1	6																					
S 17	1	12																					
M 18	0	0																					
T 19	1	6																					
W 20	1	12																					
T 21	0	0																					
F 22	1	10																					
S 23	0	0																					
S 24	0	0																					
M 25	0	5																					
T 26	1	18																					
M 27	0	0																					
T 28	1	15																					
F 29	0	5																					
S 30	0	0																					

LEGEND : ONE □ - ONE REIPL
 ONE * - ONE MINUTE OF DOWNTIME

S/370 DOWNTIMES-DURING NOV 74

			TIME OF DAY (HOURS)																								
DAY	RELOADS	DNTIME	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
F 1	0	8									I																
S 2	3	26												H	S					H							
S 3	1	5													H												
H 4	0	5									I																
T 5	0	10									I																
W 6	0	0																									
T 7	0	0																									
F 8	0	0																									
S 9	4	23												HO				S									
S 10	1	5																									
H 11	3	38																									
T 12	1	12									I																
W 13	3	22												HH													
T 14	4	29																									
F 15	1	15																									
S 16	1	6																									
S 17	1	12																									
H 18	0	0																									
T 19	1	6																									
W 20	1	12									I																
T 21	0	0																									
F 22	1	10																									
S 23	0	0																									
S 24	0	0																									
H 25	0	5									I																
T 26	1	18																									
W 27	0	0																									
T 28	1	15																									
F 29	0	5									I																
S 30	0	0																									

LEGEND : H FOR HARDWARE
 S FOR SOFTWARE
 O FOR OPERATIONAL
 U FOR UNEXPLAINED
 I FOR LATE IPL

STATISTICS

TOTAL SCHEDULED HOURS OF PRODUCTION : 468
 TOTAL DOWNTIME (MN) : 207 , AVG/DAY : 9.57 , AVG/PROD HOUR : 0.31
 TOTAL REIPL'S : 20 , AVG/DAY : 0.93
 DOWNTIME RATE IS : 1.03 PERCENT OF SCHEDULED PRODUCTION HOURS

HSJS MONTHLY STATISTICS

During the month of November, 1974, 232,380 jobs were processed compared with 221,457 for the previous year, an increase of 4.9%.

The following charts summarize the HSJS activity for the month of November. The graph represents the average number of jobs processed during each half hour period of the day.

Mark Tapia

RESOURCE USAGE BY PROCESSOR

PROCESSOR	#USES	%TOTAL	TOTAL PER PROCESSOR			AVERAGE PER USE		
			CPU (MIN)	#CARDS READ	#LINES PRINTED	CPU (MIN)	#CARDS READ	#LINES PRINTED
WATFIV	96947	(42)	939.15	10594426	13639357	0.008	108	140
PL/C	64556	(28)	690.50	5327936	10852729	0.008	80	168
OTHER*	43187	(19)	546.27	2825546	5310700	0.012	64	120
WATSOL	7080	(3)	116.15	1355387	2157810	0.016	276	304
UTILITY	6483	(3)	19.34	837378	1052423	0.000	128	160
SPITBOL	5944	(3)	75.61	930201	1340956	0.012	156	224
ASMG	3418	(1)	41.39	368053	655492	0.012	104	188
SIMON	1807	(1)	6.75	79111	113597	0.000	40	60
PLUTO	1486	(1)	41.25	398861	495074	0.027	260	332
ALGOLW	1193	(1)	30.63	219398	221894	0.023	180	184
LISP	156	(0)	3.49	11127	17535	0.020	68	112
ASSIST	123	(0)	0.61	14138	24644	0.004	112	200
TOTAL	232380		2511.15	23551562	35881101	0.011	101	154

*SP/x, SPSSQ and SNAP

INTERACTIVE SYSTEMS RELIABILITY

The uptimes achieved for the month of November for each of APL, ATS, and CPS were 97.50%, 97.23% and 97.18% of scheduled operation, respectively. The number of scheduled hours of operation during the month of November totalled 481, while the number of unscheduled IPL's per day was 0.50. In addition to the scheduled time, APL, ATS and CPS were also available for approximately 52 hours of unattended weekend operation.

The following table summarizes the time lost out of scheduled hours of production due to system failures for each of the systems. Ten unscheduled IPL's were required as a result of the failures. Problems with LCS and Multiplexor channel accounted for most of the downtime.

Kam Jain

DATE	DOWNTIME (mins)			REASON
	APL	ATS	CPS	
Fri. Nov. 1	19	21	23	Solid System - Test I/O (HARDWARE)
Wed. Nov. 6	39	26	33	*APL Control Term. Locked (SOFTWARE)
Wed. Nov. 13	41	44	46	*Channel Error (HARDWARE)
Thu. Nov. 14	04	05	07	Late IPL due to IBM Maintenance
Fri. Nov. 15	40	29	43	Late due to APL - 3705 problem (SOFTWARE)
"	19	21	22	*CPU dropped into Manual (HARDWARE)
Sat. Nov. 16	251	255	257	*Channel Control Check (HARDWARE)
Sun. Nov. 17	08	139	141	*LCS Failure (HARDWARE)
Mon. Nov. 18	21	22	24	Late IPL-3705 HASP Line Problem (HARDWARE)
"	23	25	27	*Solid System on Test I/O (HARDWARE)
Wed. Nov. 20	13	15	16	*Channel Error (HARDWARE)
Thu. Nov. 21	17	18	23	*APL Abend-SOF3 (SOFTWARE)
Mon. Nov. 25	18	20	22	Late IPL-APL File Subsystem EC!!
"	32	34	35	*Solid System on Test I/O (HARDWARE)
Thu. Nov. 28	28	64	30	Late IPL-ATS SVC Problem (SOFTWARE)
Sat. Nov. 30	147	59	63	*APL Histogram Full (SOFTWARE)
Total	720	797	812	*IPL Required
System Failures November 1 November 30, 1974				

NEW VERSION OF APL*PLUS

On Saturday, December 14, 1974 APL*PLUS was upgraded to level 4. Several enhancements have been incorporated. These include:

<u>CHARACTER</u>	<u>NAME</u>
* or *	diamond
{ or {	left brace
} or }	right brace
(	left tack
)	right tack
⌈	thorn
⌊	hydrant

<u>OPERATOR</u>	<u>DESCRIPTION</u>
$\Delta W S$	returns various information about the contents of the workspace depending upon the dyadic arguments.
$\Delta F D$	facility for manipulating an APL function as a character matrix.
$\circ \backslash$	Scan - yielding cumulative results of the form $+\backslash$, $\times \backslash \dots$
<i>QUIETLOAD</i>	function to load another workspace; similar to <i>AUTOLOAD</i> , except the <i>SAVED....</i> message is not printed.
*	Diamond - used in a function to denote the end of a statement in a line.

There have also been improvements made to the file subsystem, most notably in the more rapid processing of *FERASE* and *FDROP* requests. However, many of the changes made in level 4 have been internal to the APL system itself and consequently will be transparent to the user.

For further information about these and other features now available on APL*PLUS, type....

)LOAD 1 APL4

Ron Thompson

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Joyce Walton

DATATALK PUBLICATIONS

University of Toronto DATATALK has made available pocket-size pamphlets of information that may be useful to those of you who code APL for yourselves.

cont'd...

DATATALK PUBLICATIONS

Cont'd.

These are:

1. "APL Transmission Codes and Dyadic I-Beams"
(August '74)
2. "The DATATALK Pocket Guide to Δ FD/ Δ WS and APL4"
(January '75)

These publications are available free of charge at the UTCC Information Office, or telephone us and we'll mail you a copy. DIAL 928-6710.

Ernst GoetzeDATATALK DIALOGUE: ZERO SEARCH BY NEWTON'S METHOD

Last month, in November COMPUTERNEWS, we began to tell you about one of the more unusual DATATALK applications. To review, the problem was to find the Y value for which X assumed its largest value, subject to the restraint that X and Y satisfy the equation:

$$X^2 + Y^2 = \sin(X + Y)$$

Since no alternative was suggested, we solved the equation for X, given Y, for a range of Y values between 0 and 1. A sketch plot and some simple numerical work convinced us that an approximate solution to the problem was X maximum = 0.9297 when Y = 0.21.

However, the surprise was that only a few iterations of the familiar Newton's rule, implemented in APL desk calculator mode, allowed us to converge to a solution to double-precision machine accuracy.

DATATALK: Hello, Daniel? Ernst Goetze here, DATATALK services.

C: Oh, hi! Were you able to ...ah... do any better with that problem?

D: Yes, I think we did. I used the rough estimate of X=0.9297 with Y=0.21 to start an iteration by Newton's rule.

C: Oh, really? You mean applying a correction to each estimate of the value of the function divided by the derivative?
(New X = Old X - F(X)/F'(X))

DATATALK DIALOGUE

Cont'd.

D: Yes, but in this case, with two variables, the derivative is the Jacobian of a transformation in two variables. I reasoned.....

Since X is a smooth function of Y wherever it is defined, in order to have a value of Y for which X is maximum, I have to have the derivative of X with respect to Y equal to zero.

C: Yes, so....

D: That amounts to simultaneously solving two equations in X and Y - the original equation, and the derivative equation.

$$\begin{aligned} & (X^2 + Y^2 - \sin (X+Y) = 0 , \text{ and} \\ & 2Y - \cos (X+Y) = 0 ; \text{ or } F(X,Y)=0 \text{ and } G(X,Y)=0) \end{aligned}$$

The Jacobian....

C: Wait a minute, you got the second equation by taking the derivative of the original equation with respect to Y set to zero?

D: Yes.

C: O.K.

D: The Jacobian of that transformation defined by F and G is a two by two matrix.

$$J(X,Y) = \begin{pmatrix} 2X - \cos (X+Y) & 2Y - \cos (X+Y) \\ \sin (X+Y) & 2 + \sin (X+Y) \end{pmatrix}$$

It wasn't too hard to set that up and iterate.

D: The final answer is X maximum = 0.92974 64068 994516
when Y = 0.20925 21290 77053

And there was no change after four iterations.

C: Only four iterations? Maybe I could have done that with a desk calculator after all!

D: True, but it's messy. Still, after only two iterations the result was good to about five figures. On the other hand, evaluating the function and inverting the Jacobian was a lot easier to do with a computer, and I got the accurate solution that way in a few minutes.

C: I'd like to see the output. Have you still got it?

D: Yes, it shows the change in X and Y, the new values after each iteration, and the values of F and G. I'll send it along to you.

C: Fine. Very good, in fact. Thank you. Good-bye.

Ernst Goetze

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2741 7103
TTY 7100

SYSTEM/370 MODEL 165-II

- located in SF103/105/112
- provides General Purpose Job Stream, High Speed Job Stream and TSO services
- 3072K bytes of memory
- 1 drum
- 12 disk drives (3330)
- 8 disk drives (2314)
- 6 magnetic tape drives (4 9-track and 2 7-track)
- 6 display consoles
- 6 printers
- 5 card readers
- 1 card punch
- 7 remote batch terminals
- 1 paper tape reader
- Calcomp plotters (11" and 30")
- Gould plotter (11")
- OS/MVT with HASP

SYSTEM/360 MODEL 65

- located in McLennan Physical Laboratories
- provides Interactive Systems Service
- 1536K bytes of core
- 16 disk drives (2314)
- 2 9-track magnetic tape drives
- 1 printer
- 1 card reader
- 1 card punch
- 140 typewriter terminals
- OS/MVT with APL, ATS, and CPS

7094 II

- located in Room 1203 Burton Tower
- 32K words of core
- 1 disk
- 8 magnetic tape drives
- input/output via a 1401 computer

COMPUTER RESEARCH FACILITY

- located in SF207
- DEC GT44 System with
 - 1 PDP-11/40 CPU
 - 2 9-track dual density tape drives
 - 1 1000 cpm card reader
 - VT17 graphics display unit
 - 1 lab. peripheral system with A/D & D/A
- DEC GT40 System with
 - 1 PDP-11/10 CPU
 - 1 2314 type disk drive
 - 1 VT12 graphic display unit
 - 9-track/800 BPI tape drive
 - 1 Calcomp microfilm plotter
- 2 digitizing tablets
- 1 2701 data adapter with RADDTS

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